

IN THE CLAIMS:

Please add new claims 30 through 56. No new matter is believed to be introduced as a result of such new claims.

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30. (New) An x-ray device, comprising:

- (a) a vacuum enclosure
- (b) an integral cathode disposed in said vacuum enclosure and including an emitter that serves as the primary electron source for the x-ray device, said emitter substantially comprising an emissive material and a geometry of said emitter being such as to cause at least some electrons discharged by said emitter to converge at a focal spot;
- (c) a power source configured for communication with said integral cathode; and
- (d) a target anode disposed in said vacuum enclosure and having a target surface positioned to receive at least some electrons discharged by said emitter.

31. (New) The x-ray device as recited in claim 30, wherein said emitter substantially comprises a single piece of emissive material.

32. (New) The x-ray device as recited in claim 30, wherein said emitter comprises a plurality of subsidiary emitting portions.

33. (New) The x-ray device as recited in claim 32, wherein at least one of said subsidiary emitting portions is substantially planar.

34. (New) The x-ray device as recited in claim 32, wherein at least one of said subsidiary emitting portions substantially comprises a geometry selected from the group consisting of: parabolic sections; and spherical sections.

35. (New) The x-ray device as recited in claim 30, wherein said emitter defines at least one cutout portion.

36. (New) The x-ray device as recited in claim 30, wherein said geometry of said emitter substantially comprises a parabolic section.

37. (New) The x-ray device as recited in claim 30, wherein said geometry of said emitter substantially comprises a spherical section.

38. (New) The x-ray device as recited in claim 30, wherein said geometry of said emitter substantially comprises an angular bend.

39. (New) The x-ray device as recited in claim 30, wherein said emissive material of said emitter substantially comprises a refractory metal.

40. (New) The x-ray device as recited in claim 30, wherein said emissive material of said emitter substantially comprises a combination of tungsten and rhenium.

41. (New) The x-ray device as recited in claim 30, further comprising a support cartridge wherein at least a portion of the emitter is positioned.

42. (New) The x-ray device as recited in claim 41, wherein said support cartridge facilitates definition of said geometry of said emitter.

43. (New) The x-ray device as recited in claim 41, wherein said support cartridge substantially comprises an electrically non-conductive material.

44. (New) In an x-ray device having a vacuum enclosure wherein is substantially disposed a target anode that includes a target surface, an integral cathode substantially disposed in said vacuum enclosure in a spaced apart configuration with respect to said target surface of said target anode, the integral cathode comprising:

(a) an emitter that serves as the primary electron source for the x-ray device, said emitter substantially comprising an emissive material and a geometry of said emitter being such as to cause at least some electrons discharged by said emitter to converge at a focal spot; and

(b) a support cartridge wherein at least a portion of the emitter is positioned.

45. (New) The integral cathode as recited in claim 44, wherein said emitter substantially comprises a single piece of emissive material.

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46. (New) The integral cathode as recited in claim 44, wherein said emitter comprises a plurality of subsidiary emitting portions.

47. (New) The integral cathode as recited in claim 46, wherein at least one of said subsidiary emitting portions is substantially planar.

48. (New) The integral cathode as recited in claim 46, wherein at least one of said subsidiary emitting portions defines a geometry selected from the group consisting of: parabolic sections; and spherical sections.

49. (New) The integral cathode as recited in claim 44, wherein said emitter defines at least one cutout portion.

50. (New) The integral cathode as recited in claim 44, wherein said geometry of said emitter substantially comprises a geometry selected from the group consisting of: parabolic sections; and spherical sections.

51. (New) The integral cathode as recited in claim 44, wherein said emitter substantially comprises a refractory metal.

52. (New) The integral cathode as recited in claim 44, wherein said support cartridge facilitates definition of said geometry of said emitter.

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53. (New) In an x-ray device having a vacuum enclosure wherein is substantially disposed a target anode that includes a target surface, an integral cathode substantially disposed in said vacuum enclosure in a spaced apart configuration with respect to said target surface of said target anode, the integral cathode comprising:

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- (a) an emitter that serves as the primary electron source for the x-ray device, said emitter substantially comprising a single piece of emissive material and a geometry of said emitter being such that said emitter includes convex and concave sides, said concave side of said emitter being positioned such that at least some electrons discharged by said emitter converge at a focal spot proximate the target surface of the target anode; and
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- (b) a non-electrically conductive support cartridge wherein at least a portion of the emitter is positioned, said support cartridge facilitating definition of said geometry of said emitter.

54. (New) The integral cathode as recited in claim 53, wherein said geometry of said emitter is selected from the group consisting of: parabolic sections; and spherical sections.

55. (New) The integral cathode as recited in claim 53, wherein said emitter defines at least one cutout portion.

56. (New) The integral cathode as recited in claim 53, wherein said emitter substantially comprises a refractory metal.
